Second Order Equations

Solving second order linear nonhomogeneous differential equations

Objectives

Students should be able to do the following:

- To solve second order, linear, nonhomogeneous differential equations with simple sources.
- To compute the Laplace Transform of simple functions.
- To use the Laplace Transform to solve second order, linear differential equations.

Recitation Worksheet Problems: Sections 2.3, 3.1, 3.2

1. Use the **undetermined coefficients method** to find the solution of the IVP

$$y'' + 5y' + 6y = e^t, \quad y(0) = 0, \quad y'(0) = 0.$$

2. Use the **undetermined coefficients method** to find the solution of the IVP

$$y'' + 5y' + 6y = e^{-2t}, \quad y(0) = 0, \quad y'(0) = 0.$$

3. Use the **Laplace transform method** to find the solution of the IVP

$$y'' + 5y' + 6y = e^{-3t}, \quad y(0) = 0, \quad y'(0) = 0.$$

Note: If you use the Laplace Transform Method, expand your solution using partial fractions, but you do not need to find the exact values of the constants in this expansion. Your final solution for $y(t)$ could involve general constants A, B, and C.